

A Review of Wetland Resources in the Steep Slope Terrain of West Virginia

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Mountaintop Mining/Valley Fill
Programmatic Environmental Impact
Statement

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Introduction

Wetland resources can be of significant importance in protecting and improving water quality. They can filter pollutants from the water column, provide habitat, and provide a food source for many aquatic, avian, and terrestrial species. Wetlands can also provide significant sediment trapping and flood control benefits.

A typical mountaintop mining/valley fill (MTM/VF) operation in the Appalachian coalfields removes overburden and interburden material to facilitate the extraction of low-sulfur coal seams, and has often required the placement of excess spoil into valleys containing first and second order streams. While it is likely that few wetland resources exist naturally in the steep slope terrain areas because of the topography, the actual impacts of MTM/VF operations on these resources is largely unknown. Moreover, during scoping sessions and technical symposia held for the Mountaintop Mining/Valley Fill Programmatic Environmental Impact Statement, it was reported by industry representatives that new wetland communities are becoming established at reclaimed mine sites, often within sediment retaining structures or in other basin areas on the mined sites. The extent of these areas or the functions they are providing, however, is also uncertain.

To evaluate these issues, a workplan was developed to assess the prevalence and functions of wetland resources in the steep slope mining region. This workplan can be seen on EPA's mountaintop mining web site at www.epa.gov/region3/mtntop.

Approach

To assess the degree to which wetland resources exist in the steep slope area, National Wetland Inventory (NWI) maps were reviewed for the same five watersheds being evaluated under workplans developed by the Stream and Fisheries Teams for the EIS (Twentymile Creek, Spruce Fork, Mud River, Island Creek, and Clear Fork). NWI maps were developed by the U.S. Fish and Wildlife Service to identify natural and/or manmade wetland systems in existence at the time of mapping, and can be used as a screening tool to assess the relative percent of wetlands in the landscape.

To assess wetland functions typically found on reclaimed mine sites, a field team performed functional assessments (water quality, wildlife, and sediment trapping) on November 16-17, 1999 at ten wetland sites suggested by coal companies. The Evaluation of Planned Wetlands (EPW) technique, a rapid-assessment procedure developed by Environmental Concern, Inc., was utilized to perform these field assessments. Three EPW functions were selected:

- Sediment Stabilization- Capacity to stabilize and retain previously deposited sediments.
- Water Quality- Capacity to retain and process dissolved or particulate materials to the

- benefit of downstream surface water quality.
- Wildlife- Degree to which a wetland functions as habitat for wildlife as described by habitat complexity.

The functional capacity is determined by comparing elements of physical, chemical, or biological characteristics that demonstrate the wetland's capacity to perform a function. The element score is a unitless number from 0.0 to 1.0, where 1.0 represents the optimal condition for maximizing functional capacity and 0.0 represents an unsuitable condition. A high score implies that, in comparison to the other conditions for that element, this particular condition has a greater potential to increase the wetland's functional capacity. Conversely, a low score implies that there is a low potential.

Results

As can be seen from the National Wetland Inventory maps (Attachment 1), the percentage of vegetated wetlands (PF, PEM, PSS designations) existing in these watersheds is extremely low, representing less than 1/10 of 1% of the watershed in all cases. The majority of the NWI wetlands in these watersheds, furthermore, are unvegetated wetlands, and appear in most cases to be sediment ponds (PUB designations) associated with mined sites. Unvegetated wetlands also represent a very low percentage of the landscape in these five watersheds.

As can be seen from the results of the functional assessments performed at ten wetlands sites located on reclaimed areas (Attachment 2), most of the sites functioned well as sediment retention devices. Three of the ten sites scored a maximum of 1.0 and another three sites had scores equal to or greater than 0.7. Wetlands at these sites had established persistent vegetation that could trap and hold sediment. Only two of the ten sites (111699003 and 111799004) had a high rating for the water quality function to retain and process dissolved or particulate materials to the benefit of downstream surface water quality. At one site (111699003), this high rating appeared to be as a result of sheet flow through persistent vegetation established on relatively fine mineral soils. Another site (111799004) that ranked high for water quality was established on a high-wall bench left from the pre-SMCRA mining period. Here, persistent wetland vegetation was established on a broad area of side-slope seeps, probably without any intention to collect water or provide sediment retention. Two sites rated highly for the wildlife function. One site (111799003) was found on an older (20+ years) area and was characterized by a shallow pond against a railroad crossing. Tree snags and a variety of vegetation layers characterized this old sediment basin. The wildlife functional index provides a relative measure of the degree to which a wetland functions as habitat for wildlife as described by habitat complexity. Disturbances from past mining activities at this site were minimal and a wide range of cover types was evident. Wildlife functions were low at most sites due to a lack of wildlife attractors such as snags, dense brush, and fallen trees or logs. Multiple vegetation layers were not common.

Discussion

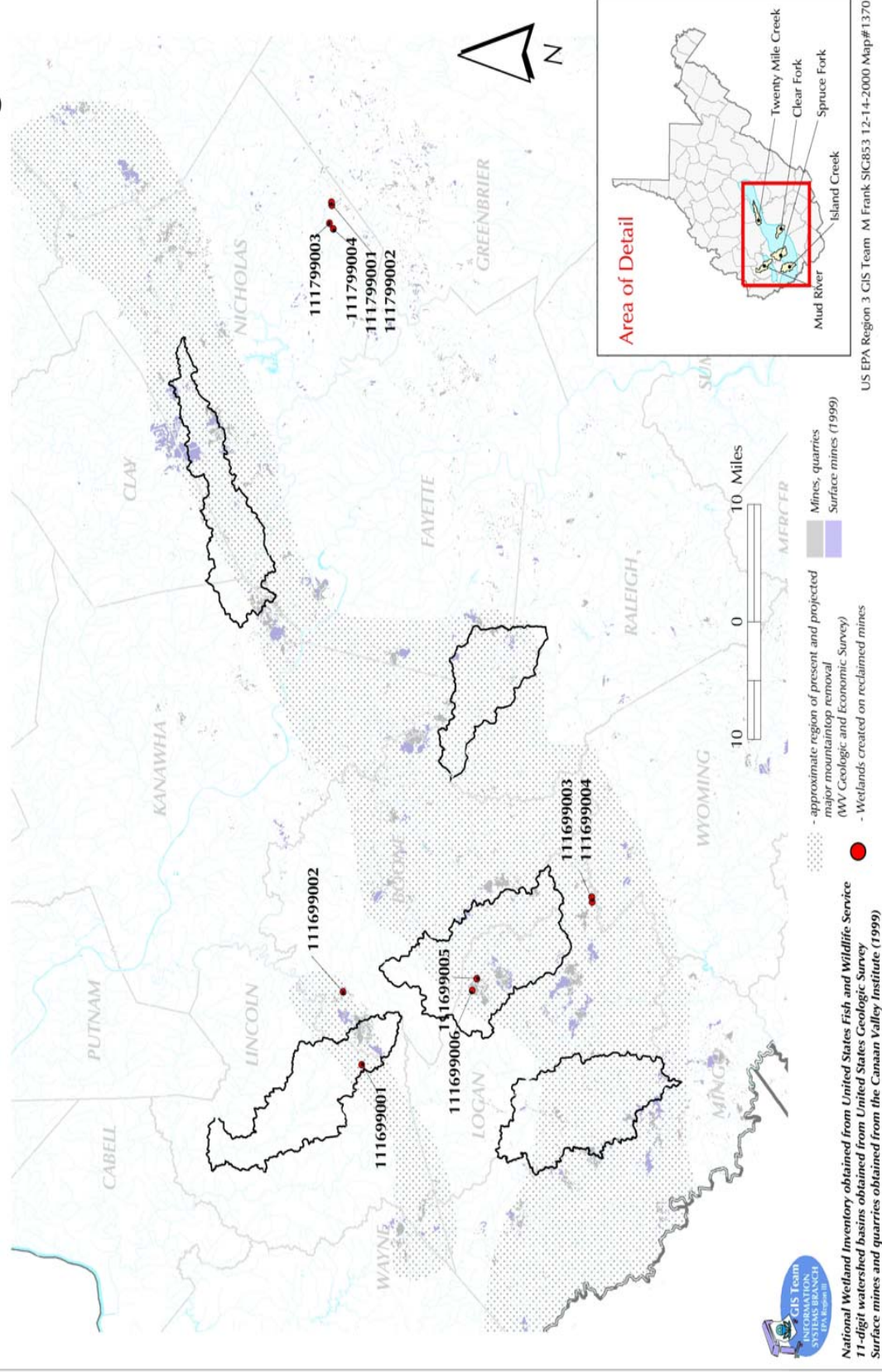
Wetland resources do not seem to be a major landcover type in the steep slope terrain of West Virginia. The predominate class, further, appears to be unvegetated ponds associated with mined sites. Vegetated wetland areas that do exist, even on mined sites, are generally small areas

scattered throughout the landscape.

At the ten wetland sites studied (mainly linear drainage structures and basin depressions) on mined areas, the functions being provided varied. Many of the wetland systems were providing excellent sediment stabilization functions, and a few were providing good water quality (as defined in EPW technique) and wildlife functions. These findings were not unexpected by the field team conducting the survey. As these structures were designed to control sediment, we expected them to score highly in this regard. The defined water quality function, on the other hand, is very much dependent on vegetative cover within the wetland system, and the low percentage of vegetative cover at these sites appeared to be the reason for their low scores in this regard. Wildlife scores are also highly dependent on the vegetative communities present, the degree of interspersion, and other physical and biological features of the system. Because these sites were not designed for these purposes, it is not surprising that they did not score highly. The areas that did score highly tended to be older systems where more complex structures were permitted to develop. The conclusion is that although many of the sites evaluated did not score highly for various wetland functions and values, opportunities do appear to exist for the creation of functioning wetland systems on mined sites. Planned wetlands, if incorporated into the restoration design, can provide valuable functions by enhancing sediment stabilization, water quality improvement, and wildlife habitat on mined sites.

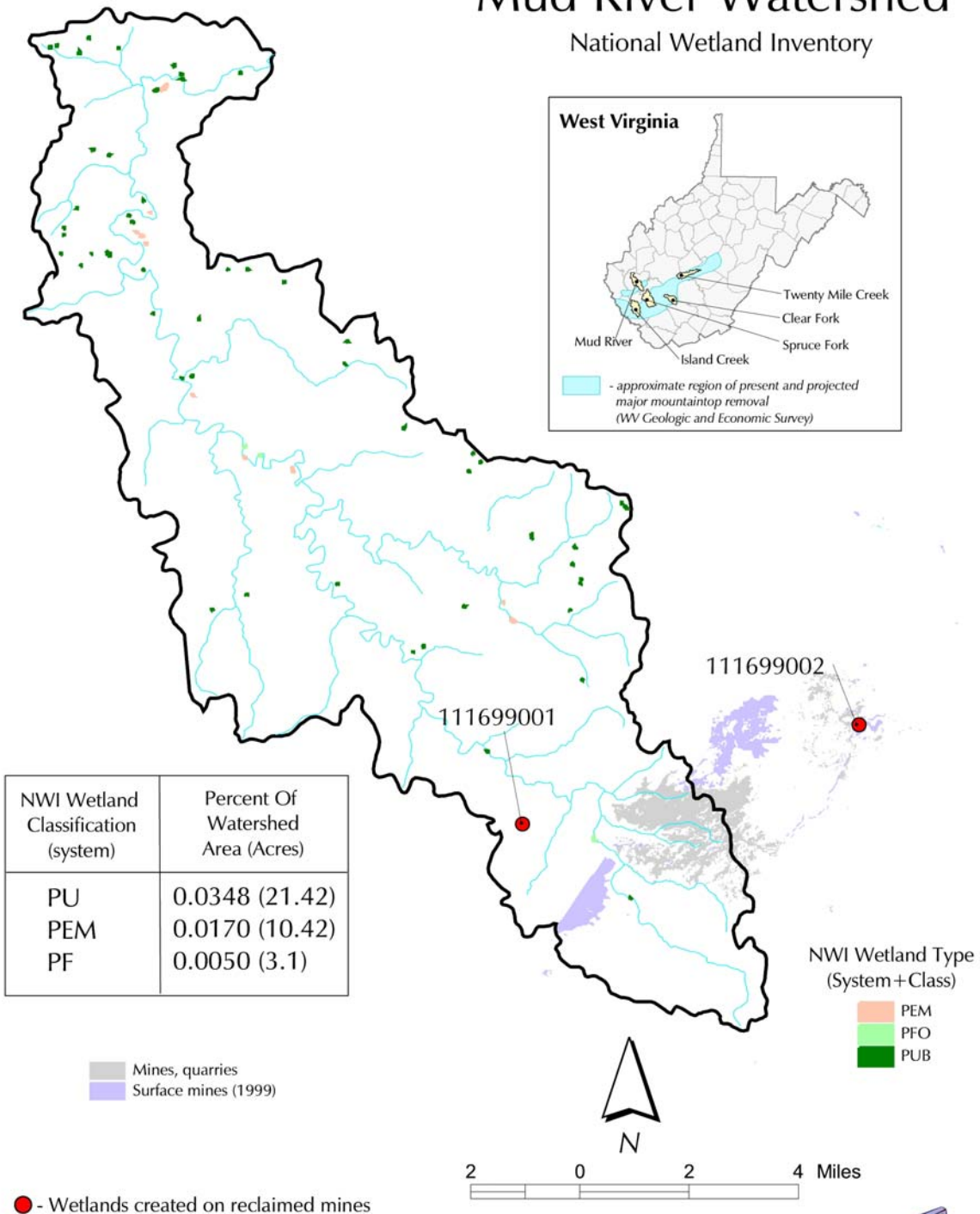
Watersheds and NWI Wetlands

West Virginia



Mud River Watershed

National Wetland Inventory



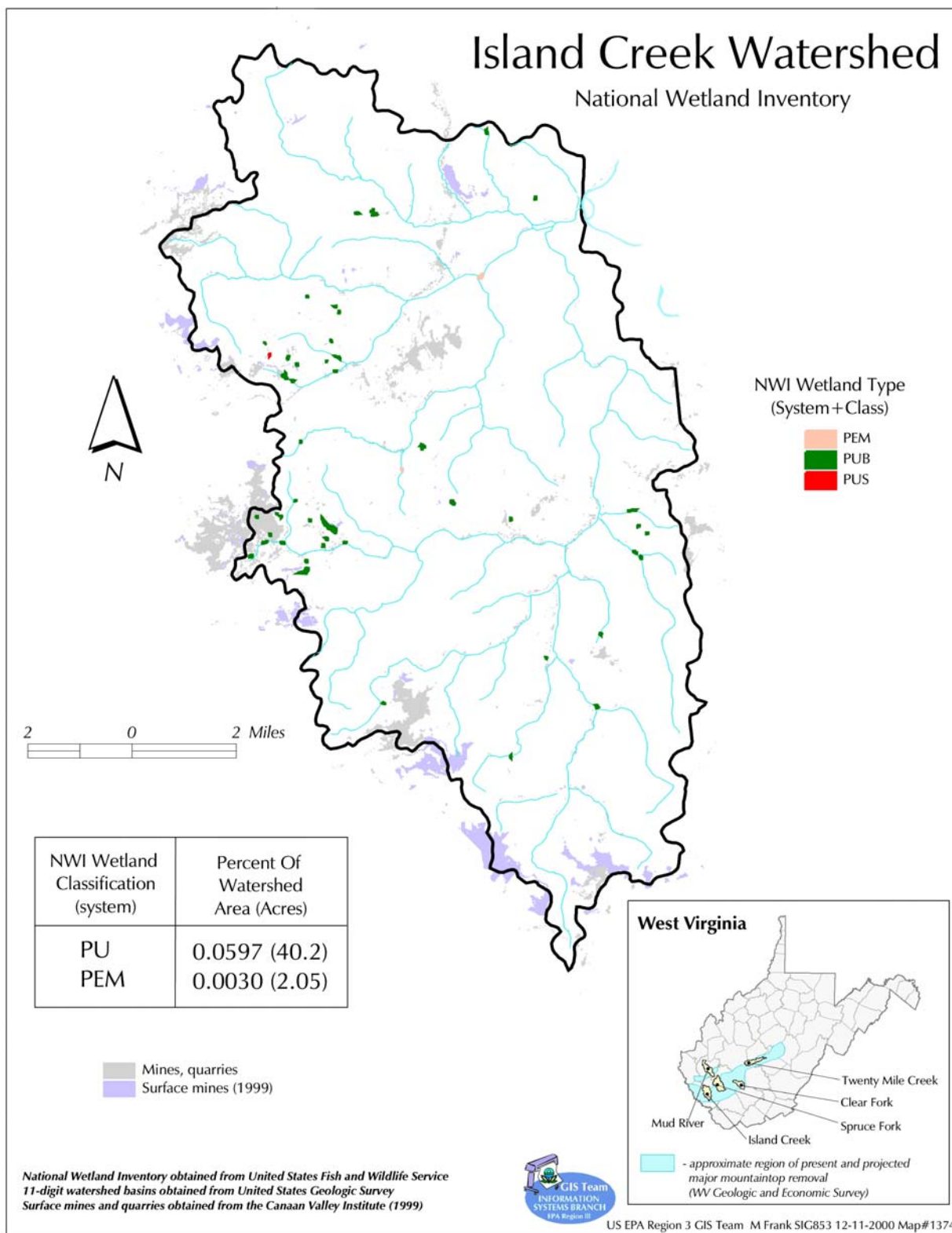
National Wetland Inventory obtained from United States Fish and Wildlife Service
11-digit watershed basins obtained from United States Geologic Survey
Surface mines and quarries obtained from the Canaan Valley Institute (1999)

US EPA Region 3 GIS Team M Frank SIG853 12-11-2000 Map#1373



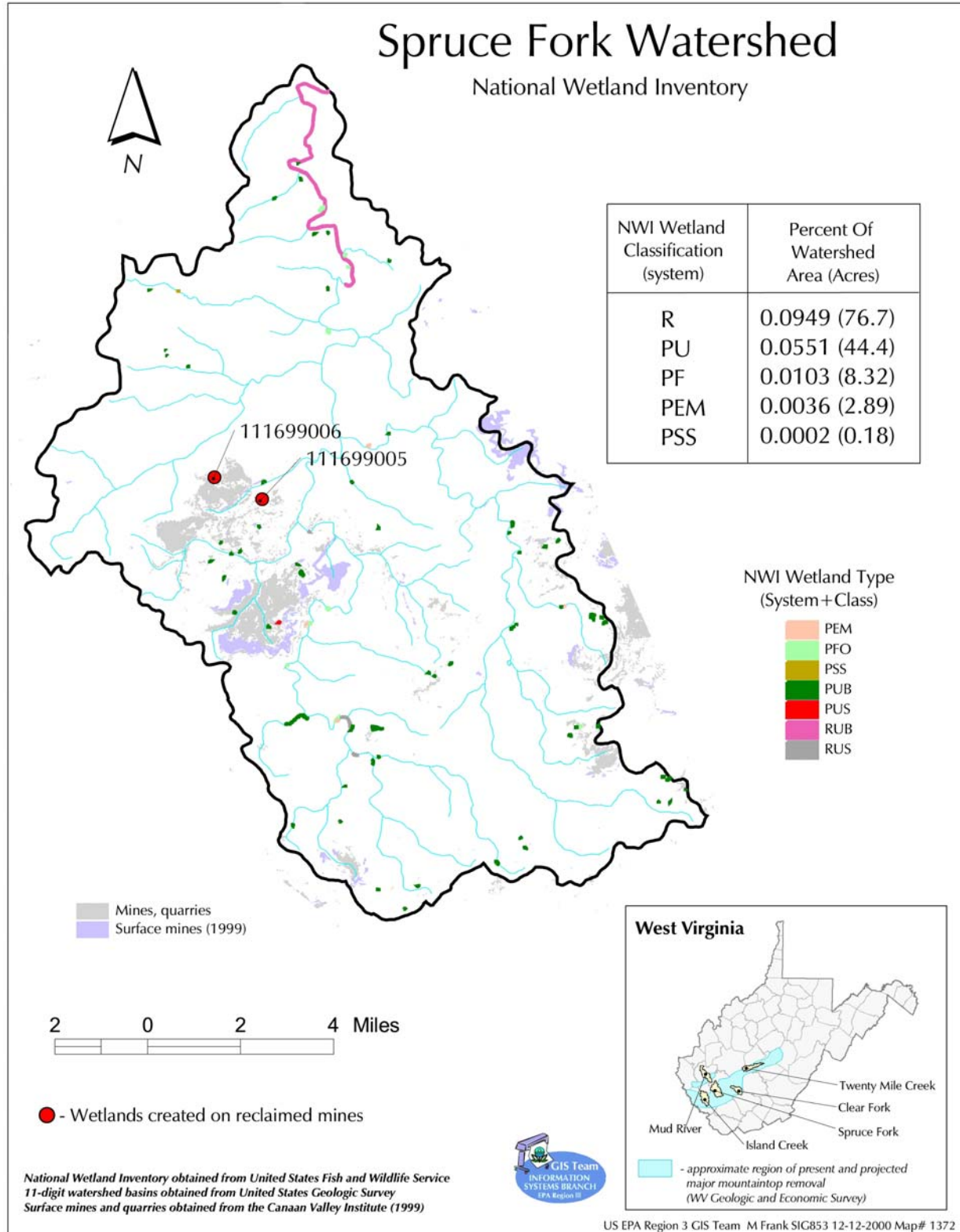
Island Creek Watershed

National Wetland Inventory



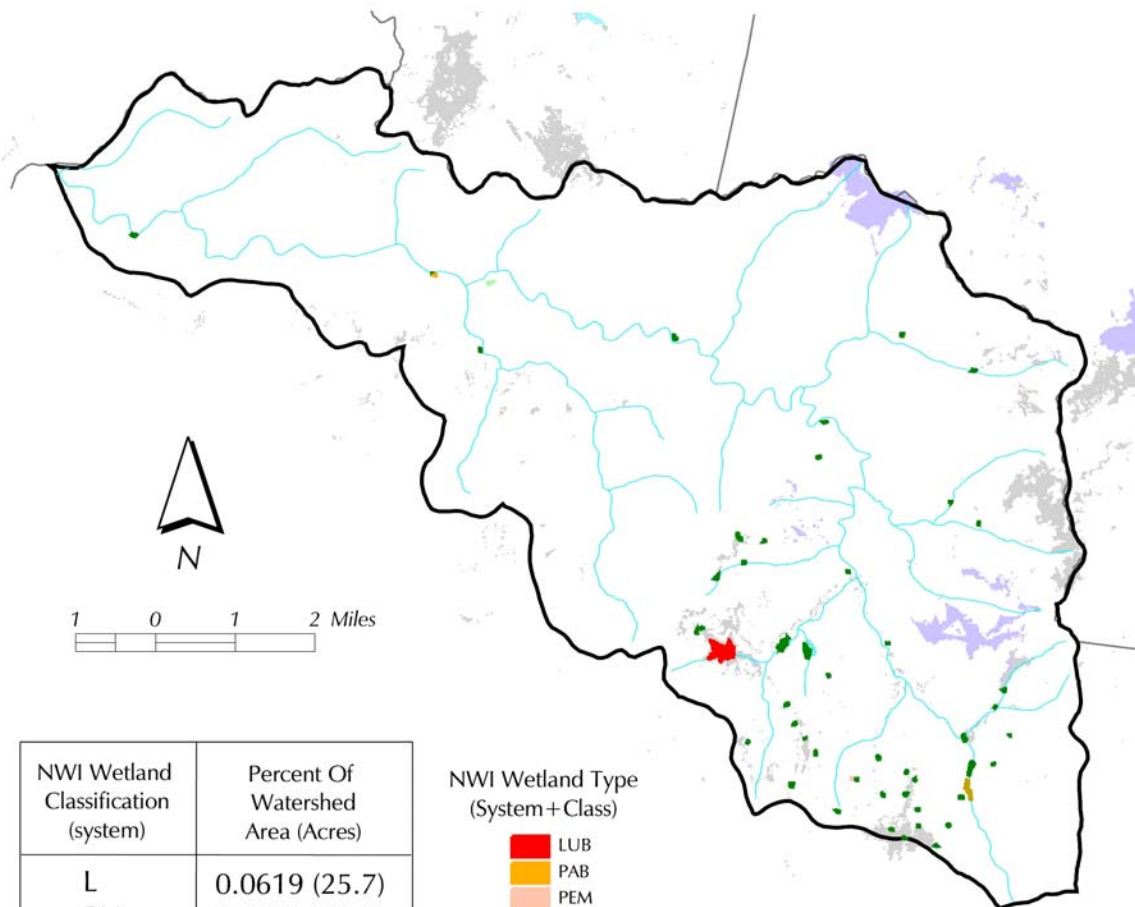
Spruce Fork Watershed

National Wetland Inventory



Clear Fork Watershed

National Wetland Inventory



NWI Wetland Classification (system)	Percent Of Watershed Area (Acres)
L	0.0619 (25.7)
PU	0.0693 (28.7)
PSS	0.0087 (3.6)
PF	0.0012 (0.50)
PEM	0.0006 (0.26)
PA	0.0007 (0.30)

NWI Wetland Type (System + Class)



Mines, quarries
Surface mines (1999)

National Wetland Inventory obtained from United States Fish and Wildlife Service
11-digit watershed basins obtained from United States Geologic Survey
Surface mines and quarries obtained from the Canaan Valley Institute (1999)



US EPA Region 3 GIS Team M Frank SIG853 12-13-2000 Map#1375

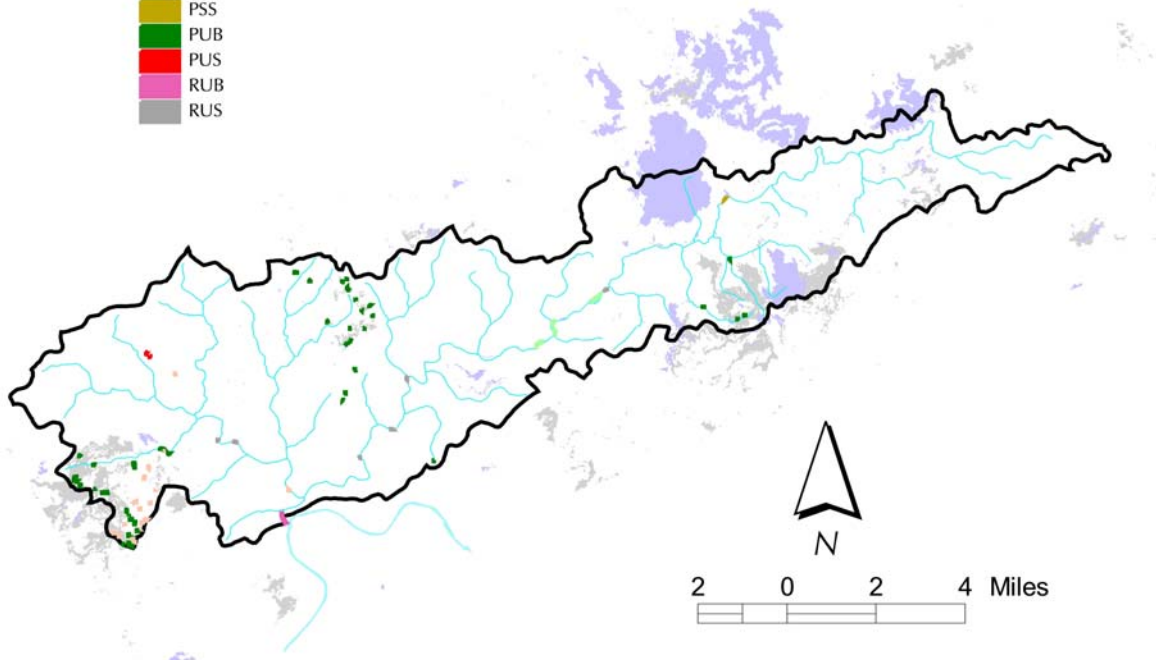
West Virginia



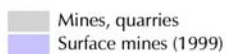
Twenty Mile Creek Watershed

National Wetland Inventory

NWI Wetland Type
(System + Class)



West Virginia



NWI Wetland Classification (system)	Percent Of Watershed Area (Acres)
PU	0.0480 (26.47)
PF	0.0221 (12.3)
PEM	0.0152 (8.42)
R	0.0152 (8.40)
PSS	0.0010 (0.57)

National Wetland Inventory obtained from United States Fish and Wildlife Service
11-digit watershed basins obtained from United States Geologic Survey
Surface mines and quarries obtained from the Canaan Valley Institute (1999)



ATTACHMENT 2

ID #	Sediment Stabilization	Water Quality	Wildlife	Description	Location
111699001	0.70	0.50	0.34	Hobet 21, left Fork of Stanley Fork S 5080-88 5,400' long x 14' long sediment ditch	N38 04.987 W81 59.091
111699002	1.00	NA	0.25	Hobet 21 - isolated basin	N38 06.736 W81 52.379
111699003	1.00	0.97	0.13	Wylo Mine Complex - Pond F; 20 years old Discharge to Buffalo Creek sediment control - 800' x 50' S0159-74	N37 46.199 W81 43.212
111699004	1.00	NA	0.23	Wylo - Depressional wetland not a drainage structure no outlet exists 5-10 acres	N37 46.238 W81 42.730
111699005	0.53	NA	0.42	Dal-Tex - Rockhouse Robinson Run Pond	N37 55.638 W81 50.673
111699006	0.87	0.61	0.50	Dal-Tex - Sediment Ditches (w/check dams) pater-noster pond ~9 acres	N37 56.017 W81 51.812
111799001	0.08	0.22	0.38	Sediment ditches drain from 2 directions to underground mine - Pre- law -Beaver S3068-88 Green Valley Coal Co.	N38 09.112 W80 38.759
111799002	0.53	0.39	0.85	with snags ponds at foot of surface mine	N38 09.150 W80 38.494
111799003	0.78	0.68	0.81	Upper Brushy Meadow Sediment	N38 09.274 W80 40.467
111799004	0.27	0.98	0.68	side-slope seeps to bench S3075-87	N38 08.935 W80 40.982